
Review of National Ambient Air Quality Standards for Ozone

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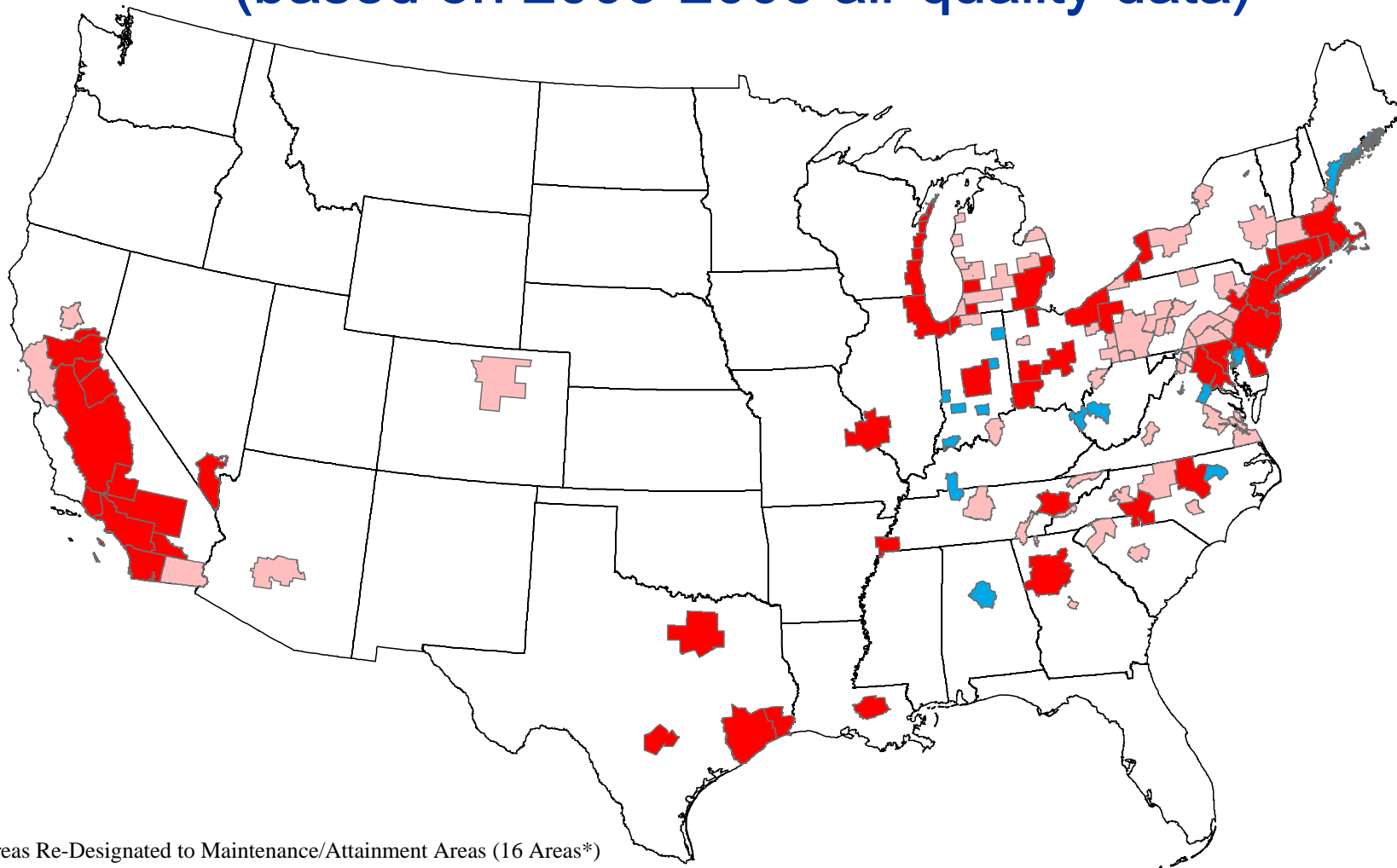
Overview and schedule

- Schedule for ozone NAAQS review
 - Final Staff Paper Analyses: January 31, 2007
 - Proposal to be signed by June 20, 2007 (consent decree)
 - Public Hearings to be held September 2007
 - Final Rule to be signed by March 12, 2008 (consent decree)
- Recap of 1997 decision on ozone NAAQS
- What's new since last review
 - Health effects evidence and risk assessment results
 - Welfare effects evidence
- Staff Paper Summary

Last Ozone NAAQS Review: 1997

- Large number of studies, particularly on 6- to 8- hour O₃ exposures
 - Strongest evidence from controlled human exposure studies of healthy young adults showing adverse effects at levels as low as 0.08 ppm
 - Decreased lung function
 - Respiratory symptoms (e.g., chest pain, cough, shortness of breath)
 - Inflammation of the lungs
 - 8-hr averaging time more directly associated with health effects at lower O₃ levels; 8-hr averaging time effectively limits both 1- and 8-hr O₃ exposures of concern
 - Results of exposure and risk assessments provide additional support for selecting 0.08 ppm level
 - Revised primary O₃ standard established in 1997
 - 0.08 ppm, 8-hour average
 - Annual 4th-highest daily maximum O₃ concentration measured at each monitor in an area
 - Averaged over 3 years
 - Replaced 0.12 ppm 1-hour average O₃ standard
 - Secondary O₃ standard set equal to the primary
 - Alternative form (SUM06) based on cumulative exposures proposed but not finalized
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Current Ozone Nonattainment Area Status (based on 2003-2005 air quality data)



■ Areas Re-Designated to Maintenance/Attainment Areas (16 Areas*)

■ Designated Nonattainment Areas Below the Level of the Standard, (58 Areas**)

■ Designated Nonattainment Areas Above the Level of the Standard, (52 Areas)

**1 Area had incomplete data for 2003-2005*

***4 Areas had incomplete data for 2003-2005*

Attainment Status as of March 19, 2007

New Health Evidence in This Review

- New clinical studies
 - Show clear and compelling evidence of adverse lung function and respiratory symptom responses in **healthy** adults from exposure to O₃ at levels as low as **0.060 ppm**
- New epidemiological studies
 - Numerous studies add to previous evidence of O₃-related respiratory morbidity effects (lung function decrements, hospital admissions, emergency department visits)
 - Multi-city studies and three meta-analyses provide evidence of a robust association between ambient O₃ and **mortality**
 - Report effects at levels well below the level of the current standard
 - No clear evidence regarding threshold: if a population threshold does exist, likely well below level of current standard and possibly within range of background concentrations
- Additional information on sensitive groups
 - Evidence indicates that people with asthma, especially children, experience more serious effects including larger lung function decrements, increased respiratory symptoms, increased airway responsiveness, and greater inflammatory responses
 - **Thus, studies of healthy subjects likely underestimate O₃-related effects on asthmatics and other sensitive groups**

Welfare Effects Evidence: Vegetation

- New studies strengthen conclusions from 1997 review:
 - Plant response to O_3 depends on both cumulative nature and level of exposure; therefore, studies have focused on metrics that are seasonal and cumulative in nature (SUM06 and W126)
 - Current ambient concentrations in many areas of U.S. are sufficient to impair growth of numerous species
 - Vegetation effects (e.g., impairment of growth and productivity, foliar injury) can occur in areas that meet the current 8-hr standard (0.08 ppm)



Staff Paper Summary

Primary Standard

- Consider a standard within the range of somewhat below 0.080 parts per million (ppm) to 0.060 ppm. Within this range, staff completed analyses of air quality, exposure, and risk at 0.074, 0.070, and 0.064 ppm representing levels within the upper, middle, and lower parts of the range, respectively.
- Retain 8-hour averaging time and give consideration to retaining the form of the current standard (i.e., the 4th maximum 8-hour average, averaged over 3 years) or an alternative form within the range of 3rd to 5th maxima, averaged over 3 years.
- Specify the level of the standard to the nearest thousandth ppm (3rd decimal place).

Staff Paper Summary

Secondary Standard

- Results of the assessment of environmental effects suggest that even when the current primary standard is attained, significant environmental effects continue to occur.
- Evidence suggests the need to adopt a more biologically relevant form — specifically a cumulative form to adjust for the differences in the way plants respond to ozone exposure as compared to humans.
- In agreement with CASAC, staff recommends considering a form of the standard known as W126. This is a cumulative, weighted total of 12-hour (8 am – 8 pm) exposures over a 3-month period giving greater weight to exposures at higher levels of ozone.
- Staff recommends a range of levels from 21 down to 7 ppm-hrs (parts per million –hours)